USDA

United States
Department of
Agriculture

Forest
Service

November 2014

Air Quality Resource Report

Little Deer Project

Goosenest District, Klamath National Forest
Siskiyou County, California

For Information Contact: Angie Bell, Forest Air Quality Coordinator
1711 South Main Street, Yreka, CA 96097
530-841-4583
albell@fs.fed.us

Table of Contents

Executive Summary

Methodology

Analysis Indicators and Methodology

Compliance with the General Conformity Rule of the Clean Air Act for nitrogen oxides must be analyzed for this project. The conformity rules apply only to the activities occurring in the federal non-attainment areas and makes exceptions for activities with emissions considered to be less than "*de minimis*" values. The *de minimis* for nitrogen oxide emissions is 100 tons per year. The average emissions of nitrogen oxides are estimated through the use of the First Order Fire Effects Model (FOFEM).

The analysis will include an evaluation of the estimated residence time of smoke from project activities and its impact to the worst days haze to determine compliance with the Regional Haze Rule. Compliance with the Regional Haze Rule requires that states make reasonable progress towards achieving natural visibility conditions in Class I areas. The reasonable progress means that the worst haze days get less hazy and that visibility does not deteriorate on the best days, when compared with the baseline period of 2000 to 2004 (California Air Resource Board, 2009). Federal agencies should not prevent this progress through management activities. Methodology is discussed in detail in the Air Quality and Fire and Fuels resource reports, available on the project website.

Spatial and Temporal Context

For this project, the spatial boundary includes the project area, the community of Butte Valley, and the Lava Beds National Park. Temporally, emissions from mobile sources such as logging trucks and tractors, as well as from prescribed burning, are transient and the impacts are short-lived and the air quality regulations are in terms of one-year emissions. The temporal analyses are on an annual basis and considered short-term. Impacts are considered long-term if they persist for more than a year. The cumulative effects of the mobile source emissions, fugitive dust and smoke emission will be addressed on the 7th field watershed scale.

Affected Environment

The project is 25 miles from Lava Beds National Park which is designated as a Class I wilderness by the Clean Air Act. The project area is primarily forested federally managed lands with no substantial human-caused emission sources within the area other than emission and fugitive dust from logging and recreation. Other emission contributions will be smoke and haze from seasonal wildland and prescribed fires from both within and outside the county. According to the California Air Resources Board (http://www.arb.ca.gov/app/emsinv/emssumcat.php) the nitrogen oxide emissions are primarily from heavy-duty diesel trucks (such as from the I-5 corridor).

Environmental Consequences

Alternative 1

Direct Effects and Indirect Effects

Under this alternative no management action will be taken that will emit nitrogen oxides, greenhouse gases, or impact the visibility in the Lava Beds National Park.

Cumulative Effects

There are no direct or indirect effects for this alternative and therefore no cumulative effects.

Alternative 2

Direct Effects and Indirect Effects

The First Order Fire Effects Model estimates there will be about 22 pounds per acre of nitrogen oxides emitted during prescribed burning of activity fuels. There is about 270 acres of pile burning related to site preparation of plantations and about 10 acres of piles of slash on landings (assumed about one-half of the landings will have piles to burn). This means the project will not emit more than about 6160 pounds or 3 tons of nitrogen oxide emissions in total. This is less than the de minimus of 100 tons per year maximum allowed to meet regulations in the Conformity Rule.

The prescribed fire proposed in the project area will occur over a few days of any given year. Burning will occur in the spring or fall, outside of the wildfire season. Since the wildfire season is the time of the year when haze is at its worse, the project won't impact visibility on the worst haze days. The likelihood that prescribed burning on a few days any given year will affect the average visibility on the best days over an entire year is small. The likelihood of preventing the progress of the Regional Haze Plan is very low for this alternative.

Cumulative Effects

Adding the effects on air quality of alternative 2 to effects of ongoing or reasonably foreseeable future actions in the project area is expected to provide minimal cumulative effects with the oversight of the Siskiyou County Air Pollution Control District. Criteria pollutant and greenhouse gas emissions will degrade air quality cumulatively with activities occurring in the surrounding area. However, these emissions are expected to be minimal and able to disperse readily. Compliance with Burn Day, Marginal Burn Day, and No Burn Day designation, and coordination with and permitting from the Siskiyou County Air Pollution Control District, will minimize cumulative effects of prescribed fire.

Alternative 3

Direct Effects and Indirect Effects

The effects of alternative 3 are the same as alternative 2 except there are only 10 acres of burning proposed (assuming about one-half of the landings will have burn piles). This reduces the nitrogen oxide emissions to less than 0.1 ton per year. The likelihood of preventing the progress of the Regional Haze Plan will measurably be less than alternative 2.

Cumulative Effects

The cumulative effects are the same as in alternative 2.

Comparison of effects

The comparison of the effects of alternatives on air quality is discussed under the effects of alternatives above and in table 2-3 in chapter 2 in this EA.

Compliance with law, regulation, policy, and the Forest Plan

All alternatives are compliant with the Clean Air Act and the Conformity Rule. The project will not prevent the progress of the State of California's Regional Haze Plan as required by the Regional Haze Rule, and will be consistent with the Forest Plan as displayed on the Forest Plan consistency checklist, available on the project website.

Air Quality Resource Report

Introduction

The purpose of this report is to analyze the effects of the project and its alternatives on air quality including ambient air quality standards. The analysis will also include discussion on haze impacts on Lava Beds National Park, a Class I Wilderness airshed, associated with good air quality.

Methodology

Emissions from prescribed fire are, on average, ten-times larger than the emissions from other activities such as timber hauling and the use of tractor yarding (California Air Resources Board, 2012). So the analysis regarding air quality will focus only on the prescribed fire proposed in the project.

Ambient Air Quality Standards

Siskiyou County is identified as attainment or unclassified for carbon monoxide, sulfur oxides, lead, respirable particulate matter and fine particulate matter for both state and federal standards. There is no further state or federal regulation for project activities that generate these emissions and they will not be analyzed further. Siskiyou County is in "non-attainment or transitional" status for the state 8-hour ozone standards. Therefore, compliance with the General Conformity Rule of the Clean Air Act for nitrogen oxides must be analyzed for this project. The conformity rules apply only to the activities occurring in the federal non-attainment areas and makes exceptions for activities with emissions considered to be less than "*de minimis*" values. The *de minimis* for nitrogen oxide emissions is 100 tons per year.

The average emissions of nitrogen oxides are estimated through the use of the First Order Fire Effects Model (FOFEM). The modeling is based on a ponderosa pine (SRM 245) under moderate weather conditions with natural fuel load. The default values for light fuel loading were used for the modeling. The First Order Fire Effects Model is recognized by the Forest Service Pacific Southwest Region as being the most current and accurate analysis tool available for emissions prediction (Reinhardt et al. 1997). It is based on extensive research in western forest ecosystems.

Regional Haze Rule

The Regional Haze Rule (1999) requires a Regional Haze Plan for Class I designated airsheds. These include National Parks and Wilderness established before 1977. Human-related sources of haze include industry, motor vehicles, agricultural and forestry burning, and dust from disturbed soils. The primary concern is the reduction of visibility in wilderness areas. The Regional Haze Rule requires that states make reasonable progress towards achieving natural visibility conditions in Class I areas. The reasonable progress means that the worst haze days get less hazy *and* that visibility does not deteriorate on the best days, when compared with the baseline period of 2000 to 2004 (California Air Resource Board, 2009). Federal agencies should not prevent this progress through management activities. The analysis will include an evaluation of the estimated residence time of smoke from project activities and its impact to the worst days haze to determine compliance with the Regional Haze Rule.

Analysis Indicators

- Compliance with the Conformity Rule
    - Estimated emissions of nitrogen oxide per year.
- Compliance with the Regional Haze Rule
    - Estimated days of visibility impacted in the wilderness which for this project is only the Lava Beds National Park
    - Likelihood of preventing progress of the California Regional Haze Plan

Spatial and Temporal Context

It is difficult to determine the spatial analysis area for effects to air quality due to the mobility of air. For this project, the spatial boundary includes the project area, the community of Butte Valley, and the Lava Beds National Park. Temporally, emissions from mobile sources such as logging trucks and tractors, as well as from prescribed burning, are transient and the impacts are short-lived and the air quality regulations are in terms of 1-year emissions. In light of this, the temporal analyses are on an annual basis and this is considered short-term. Impacts are considered long-term if they persist for more than a year. The cumulative effects of the mobile source emissions, fugitive dust and smoke emission will be addressed on the 7th field watershed scale.

Affected Environment

According to the California Air Resources Board website (www.arb.ca.gov) Siskiyou County is in "non-attainment/transitional" status for 8-hour ozone, a product of volatile organic compounds or nitrogen oxides.

The project area is primarily forested federally managed lands with no substantial human-caused emission sources within the area other than emission and fugitive dust from logging and recreation. Other emission contributions will be smoke and haze from seasonal wildland and prescribed fires from both within and outside the county. According to the California Air Resources Board (http://www.arb.ca.gov/app/emsinv/emssumcat.php) the nitrogen oxide emissions are primarily from heavy-duty diesel trucks (such as from the I-5 corridor).

The project is 25 miles from Lava Beds National Park which is designated as a Class I wilderness by the Clean Air Act. The haze species concentrations are measured as part of the IMPROVE (Interagency Monitoring of Protected Visual Environments) monitoring network deployed throughout the United States. The visibility conditions for Marble Mountain Wilderness are currently monitored by an IMPROVE monitor in the Trinity Alps. The 24 days with the worst visibility are averaged each year and used to determine the worst days' visibility. The worst air quality days are dominated by organic aerosols (particulate matter associated that cause a haze in the air). Organic aerosols peak during the summer months and are strongly correlated with the incidence of wildfires (California Air Resource Board, 2009). The amount of light extinction affects visibility or the clarity of objects viewed at a distance by the human eye this is measured in "deciviews" which are the amount of obstruction the haze in the air causes; higher numbers mean you cannot see as far into the distance.

Environmental Consequences

Alternative 1

Direct and Indirect Effects

Under this alternative no management action will be taken that will emit nitrogen oxides, greenhouse gases, or impact the visibility in the Lava Beds National Park.

Cumulative Effects

There are no direct or indirect effects for this alternative and, therefore, no cumulative effects.

Alternative 2

Direct and Indirect Effects

The First Order Fire Effects Model estimates that there will be approximately 22 pounds per acre of nitrogen oxides emitted during prescribed burning of activity fuels. There is about 270 acres of pile burning related to site preparation of plantations and about 10 acres of piles of slash on landings (assumed about one half of the landings would have piles to burn). This means that the project will not emit more than about 6160 pounds or 3 tons of nitrogen oxide emissions in total. This is less than the *de minimus* of 100 tons per year maximum allowed to meet regulations in the Conformity Rule.

The prescribed fire proposed in the project area will occur over a few days of any given year. Burning will occur in the spring or fall, outside of the wildfire season. Since the wildfire season is the time of the year when haze is at its worse, the project won't impact visibility on the worst haze days. The likelihood that prescribed burning on a few days any given year will affect the average visibility on the best days over an entire year is small. The likelihood of preventing the progress of the Regional Haze Plan is very low for this alternative.

Cumulative Effects

Adding the effects on air quality of Alternative 2 to effects of ongoing or reasonably foreseeable future actions in the project area is expected to provide minimal cumulative effects with the oversight of the Siskiyou County Air Pollution Control District. Criteria pollutant and greenhouse gas emissions will degrade air quality cumulatively with activities occurring in the surrounding area. However, these emissions are expected to be minimal and able to disperse readily. Compliance with Burn Day, Marginal Burn Day, and No Burn Day designation, and coordination with and permitting from the Siskiyou County Air Pollution Control District, will minimize cumulative effects of prescribed fire.

Alternative 3

Direct and Indirect Effects

The effects of Alternative 3 are the same as for Alternative 2 except there are only 10 acres of burning proposed (assuming about one-half of the landings will have burn piles). This reduces the nitrogen oxide emissions to less than 0.1 ton per year. The likelihood of preventing the progress of the Regional Haze Plan will measurably be less than in Alternative 2.

Cumulative Effects

The cumulative effects are the same as in alternative 2.

Compliance with law, regulation, policy, and the Forest Plan

All alternatives are compliant with the Clean Air Act and the Conformity Rule. The project will not prevent the progress of the State of California's Regional Haze Plan as required by the Regional Haze Rule.

References Cited

California Air Resources Board. 2009. Regional Haze Plan. Retrieved from http://www.arb.ca.gov/planning/reghaze/rhplan.htm on 4 April 2014.

Reinhardt, E., Keane, R., Brown, J. (1997) First Order Fire Effects Model: FOFEM 4.0 User's Guide. USDA, US Forest Service. Intermountain Research Station General Technical Report. INT-GTR-344.

California Air Resource Board. 2012. Almanac Emissions Projection Data – 2012 Estimated Annual Average Emissions: Northeast Plateau Air Basin. Retrieved on 16 April 2014 from http://www.arb.ca.gov/app/emsinv/2013/emssumcat_query.php?F_YR=2012&F_DIV=-4&F_SEASON=A&SP=2013&F_AREA=AB&F_AB=NEP#8